Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the

application:

Listing of Claims

1.   (Currently Amended) A method for compensating a ~~fluid~~ thermal

conductivity sensor ~~using~~ that includes a heater and a temperature sensor, wherein each

of said heater and said temperature sensor are in thermal communication with ~~the~~ a fluid

of interest ~~and have a resistance that changes with temperature~~, and wherein the fluid of

interest includes a first component and two or more other components, the method

comprising the steps of:

determining the variability range of ~~H_2O~~ at least one of the two or more other

components in the fluid of interest ~~to be sensed~~;

~~selecting a desired temperature for said heater; and~~

energizing the heater with an input signal to induce an elevated temperature

condition in said heater, the elevated temperature condition being such

that the combined thermal conductivity of the two or more other

components is less variable with concentration of the two or more other

components than the individual thermal conductivities of the two or more

other components; and

obtaining a measure of the thermal conductivity of the first component using said

temperature sensor.

2.   (Currently Amended) The method of claim 1 <u>wherein at least one of the</u>

<u>two or more other components includes H_2O and at least one of the two or more other</u>

<u>components includes CO_2, the method</u> further comprising the steps of:

determining the variability range of CO_2 in the fluid <u>of interest</u> ~~to be sensed~~.

3.   (Currently Amended) The method of claim 1 wherein <u>at least one of the</u>

<u>two or more other components includes H_2O, the method further comprising</u> the step of

selecting ~~a desired~~ <u>the elevated</u> temperature <u>condition</u> for said heater <u>by</u> ~~further comprises~~

~~the steps of~~:

measuring the thermal conductivity of the fluid <u>of interest</u> ~~to be sensed~~ over a

range of temperatures; and

selecting ~~the desired~~ <u>the elevated</u> temperature based on the thermal conductivity

measurements to <u>reduce</u> ~~minimize~~ the effect of H_2O.

4.   (Currently Amended) The method of claim [[1]] <u>2 further comprising</u>

~~wherein~~ the step of selecting ~~a desired~~ <u>the elevated</u> temperature <u>condition</u> for said heater

<u>by</u> ~~further comprises the steps of~~:

measuring the thermal conductivity of the fluid <u>of interest</u> ~~to be sensed~~ over a

range of temperatures; and

selecting ~~the desired~~ the elevated temperature based on the thermal conductivity

measurements to ~~minimize~~ reduce the combined effects of H_2O and CO_2.

5.   (Currently Amended) A fluid sensor for determining a selected property

of one or more components in a fluid ~~fluids~~ of interest, comprising:

a heater;

a thermal sensor in proximate position to said heater and in thermal

communication therewith through the ~~one or more fluids~~ fluid of interest,

said sensor having a temperature dependent output; ~~and~~

energizing means connected to said heater for energizing the heater to induce an

elevated temperature condition in said thermal sensor~~, wherein said~~

~~elevated temperature is preselected to minimize the effect of H_2O~~;

measuring means for obtaining a measure of the selected property of at least one

of the one or more components of the fluid of interest using said temperature sensor; and

wherein said elevated temperature condition is selected to reduce the effect of at

least one of the components in the fluid of interest on the selected property

that is measured by the measuring means.

6.   (Currently Amended) The fluid sensor of claim 5 wherein at least one of

the one or more components includes H20 and at least another of the one or more

components includes C02, and said elevated temperature condition is ~~also preselected~~

selected to ~~minimize~~ reduce the effect of H_2O and CO_2.

7.   (Currently Amended) The fluid sensor of claim 5 wherein said fluid

sensor is used to sense hydrogen concentration in the ~~one or more fluids~~ fluid of interest.

8.   (Currently Amended) The fluid sensor of claim 5 wherein the ~~one or more~~

~~fluids~~ fluid of interest includes ~~are gases~~ a gas.

9.   (Currently Amended) A method of compensating an output a fluid sensor

~~using~~ that includes a heater and a temperature sensor, comprising:

~~adjusting the output of the fluid sensor to a known value for an ambient~~

~~temperature;~~

determining the range of H_2O in the fluid to be sensed;

selecting a heater temperature to ~~minimize~~ reduce the effect of H_2O on the output

of the fluid sensor; and

heating the fluid to be sensed using the heater to the selected temperature value.

10.   (Currently Amended) The method of claim 9 further comprising the steps

of:

determining the range of CO_2 in the fluid to be sensed; and

selecting the heater temperature value to <u>reduce</u> ~~minimize~~ the effect of CO_2 on the

fluid sensor.

11.   (Currently Amended) The method of claim 9 wherein the selected

temperature is chosen to <u>reduce</u> ~~minimize any~~ non-linear sensor resistance values <u>caused</u>

<u>by the H_2O in</u> ~~for~~ the range of H_2O concentration.

12.   (Currently Amended) The method of claim 9 wherein the selected

temperature is chosen to ~~minimize any~~ <u>reduce</u> non-linear sensor resistance values <u>caused</u>

<u>by the CO_2 in</u> ~~for~~ the range of CO_2 concentration.

13.   (Currently Amended) A method for compensating a ~~fluid~~ <u>thermal</u>

<u>conductivity</u> sensor ~~using~~ <u>that includes</u> a heater and a temperature sensor, wherein each

of said heater and said temperature sensor are in thermal communication with ~~the~~ <u>a</u> fluid

of interest ~~and have a resistance that changes with temperature~~, <u>and wherein the fluid of</u>

<u>interest includes a first component, a second component that includes polar or non-</u>

<u>symmetrical molecules, and a third component that includes non-polar or symmetrical</u>

<u>molecules,</u> the method comprising the steps of:

determining the variability range of ~~CO_2~~ <u>the second component and/or the third</u>

<u>component</u> in the fluid <u>of interest</u> ~~to be sensed~~;

~~selecting a desired temperature for said heater; and~~

energizing the heater with an input signal to induce an elevated temperature

condition in said heater, the elevated temperature condition being such

that the combined thermal conductivity of the second component and the

third component is less variable with concentration of the second

component and the third component than the individual thermal

conductivities of the second component and the third component; and

obtaining a measure of the thermal conductivity of the first component using said

temperature sensor.

14.   (Currently Amended) The method of claim 13 wherein at least one of the

first and second components includes H_2O, the method further comprising the step of

selecting a desired the elevated temperature condition for said heater by further comprises

the steps of:

measuring the thermal conductivity of the fluid of interest to be sensed over a

range of temperatures; and

selecting the desired the elevated temperature based on the thermal conductivity

measurements to minimize reduce the effect of CO_2 H_2O.

15.   (Currently Amended) A fluid sensor to sense hydrogen concentrations

comprised of:

a thin film heater;

at least one thin film temperature sensor;

a semiconductor body with a depression therein; and

the heater and temperature sensor lying in a plane substantially parallel to the

semiconductor body;

an energizer coupled to said heater, said energizer providing a control signal to

said heater ~~, said heater operable~~ to induce a predetermined temperature

proximate to the heater ~~and the temperature sensor inside the fluid sensor~~,

said temperature being preselected to ~~minimize~~ reduce the effect of a fluid

from the group consisting of H_2O.

16.   (Original) The fluid sensor to sense hydrogen concentrations of claim 15

wherein said fluid sensor is operable to monitor hydrogen in a proton exchange

membrane fuel cell.

17.   (Original) The fluid sensor to sense hydrogen concentrations of claim 15

wherein said fluid sensor is operable to monitor the fluid mixture composition of one or

more refrigerants.

18.   (Currently Amended) The method of clam 1 wherein the ~~desired~~ elevated

temperature condition for said heater may be configured in the field.

19.   (Currently Amended) The method of claim 13 wherein the ~~desired~~ elevated temperature <u>condition</u> for said heater may be configured in the field.

20.   (Cancel) The method of claim 1 wherein the elevated temperature condition is said heater is the desired temperature.

21.   (Cancel) The method of claim 13 wherein the elevated temperature condition in said heater is the desired temperature.

22.   (Currently Amended) A method for compensating <u>an output of</u> a fluid sensor <u>that includes</u> ~~using~~ a heater and a temperature sensor, comprising:

        ~~adjusting the output of the fluid sensor to a known value for an ambient~~

           ~~temperature;~~

        determining the range of H_2O and CO_2 in the fluid to be sensed;

        energizing the heater in the fluid to be sensed to one or more temperatures and

           varying the amount of H_2O and CO_2 in the fluid to be sensed while

           monitoring the output of the fluid sensor;

        selecting a heater temperature value to <u>reduce</u> ~~minimize~~ the effect of H_2O and

           CO_2 on <u>the output of</u> the fluid sensor;

        heating the fluid to be sensed using the heater to the selected temperature value.

23.   (Currently Amended) The fluid sensor of claim 8 wherein its the output of the sensor is used to control the concentration of individual components resulting from mixing at least two components fluids.

24.   (Cancel) The fluid sensor of claim 5 wherein the one or more fluids of interest are gases.

25.   (Currently Amended) The fluid sensor of claim 5 wherein the one or more fluids fluid of interest includes a liquid are liquids.

26.   (Currently Amended) The fluid sensor of claim 5 wherein the one or more fluids fluid of interest includes a refrigerant are refrigerants.

27.   (New) A method for determining the thermal conductivity of a first component in a fluid stream, wherein the fluid stream includes the first component and two or more other components, each having a thermal conductivity, wherein an approximately relative concentration of the two or more other components is known, the method comprising the steps of:

exposing a thermal conductivity sensor to the fluid stream, wherein the thermal conductivity sensor includes a heater and a temperature sensor;

elevating the temperature of the heater to an elevated temperature where the

combined thermal conductivity of the two or more other components is less variable with

concentration of the two or more other components than the individual thermal

conductivities of the two or more other components; and

obtaining a measure of the thermal conductivity of the first component using the

temperature sensor.

28.   (New) A method according to claim 27 wherein, at the elevated

temperature, the combined thermal conductivity of the two or more other components is

relatively constant over a range of concentrations of the two or more other components.

29.   (New) A method according to claim 27 wherein, at the elevated

temperature, the combined thermal conductivity of the two or more other components

does not substantially affect the measure of the thermal conductivity of the first

component.

30.   (New) A method according to claim 29 wherein, at the elevated

temperature, the thermal conductivities of the two or more other components

substantially cancel each other out, so that the measure of the thermal conductivity of the

first component can more easily be obtained.

31.   (New) A method according to claim 27 wherein the two or more other

components include a second component and a third component.

32.   (New) A method according to claim 31 wherein the second component

includes H_2O.

33.   (New) A method according to claim 32 wherein the second component

includes CO_2.

34.   (New) A method for determining the thermal conductivity of a first

component in a fluid stream, wherein the fluid stream includes the first component and

two or more other components, each having a thermal conductivity, wherein an

approximately relative concentration of the two or more other components is known, the

method comprising the steps of:

exposing a thermal conductivity sensor to the fluid stream, wherein the thermal

conductivity sensor includes a heater and a temperature sensor;

elevating the temperature of the heater to an elevated temperature;

obtaining a measure of the thermal conductivity of the first component using the

temperature sensor; and

wherein the elevated temperature is such that the thermal conductivities of the two

or more other components substantially cancel each other out so that the measure of the

thermal conductivity of the first component can more easily be obtained.